Original Research Article

Learning Motivation Scale (LMS): Development and Validation with Prospective-Teachers in West Bengal, India

ABSTRACT:

Background: Learning motivation is the collective term for the internal and external factors that support or strengthen a learner's desire and willingness to acquire new knowledge. Every prospective teacher must acquire the skills necessary to do their job well, and learning is accelerated by learning motivation. Therefore, developing a standardised Learning Motivation Scale (LMS) is crucial for assessing the level of learning motivation among prospective teachers in West Bengal. The goal of the present study was to create a LMS to assess learning motivation level among prospective teachers.

Method: Fifty (50) prospective teachers from West Bengal, India, were given a self-administered version of the LMS, which consists of twenty-eight (28) items, to collect the data. The learning motivation scale was subjected to item analysis following the data collection in order to remove the poor items. Following that, the final scale's internal consistency was evaluated using the 225 participants (prospective teachers) who participated in the Cronbach's alpha method.

Result: The scale primarily consists of two subscales, intrinsic motivation and extrinsic motivation, each with twenty-eight (28) items measuring learning motivation. Following item analysis, the learning motivation scale's seven (7) poor items are eliminated in accordance with the discrimination index. As a result, 21 items from each of the two LMS subscales were kept. The scale's final iteration discovered 0.783 alpha values, a high level of statistically significant correlation.

Conclusion: The findings indicate that the Scale is a useful tool that researchers and instructors can use to effectively gauge the level of learning motivation among prospective teachers.

Key Words: *Prospective-Teacher; Learning; Motivation, Development; Validation*

1. INTRODUCTION

Education itself entails evolving in the knowledge and leading a purposeful life [1]. Motivation plays the crucial role to develop education among learners. Motivation in education can have several effects on how students learn and how they behave towards subject matter [2]. However, few men (students) who are less motivated in learning activities when confronted with the activities involved in the learning process [3]. Additionally, student achievement can describe the level of achievement of students in terms of knowledge, skills and experience of learning formulated by learning objectives for the school curriculum [4; 5; 3].

Learning and motivation are complementary concepts [6]. Learners who are motivated to learn something use higher cognitive process in learning about it [7]. The most crucial element that influences learning and success is motivation [8]. Motivation is students' energy and drives to learn, work hard, and achieve at school [9]. As most educators intuitively know, students learn more when they are creating their own learning opportunities [10]. Learning motivation is the participation of students in teaching activities, the long-term interest in learning and the commitment to their learning [11; 12].

Motivation to learn is not only energy to move students to learn, but also as something that directs student activities towards learning goal [13]. Based on Self-determination Theory (SDT), learners may be driven to learn by two sources – internal and external [7]. Generally, Intrinsic and extrinsic motivation are the two different types of motivation [7] which directly encourages the learners to achieve the learning goals. The willingness of a person to engage in an activity without receiving an external reward is known as intrinsic motivation [14]. The student who chooses to undertake out-of-class work and masters that work will be more intrinsically motivated than the student who is compelled to do the work [15]. External factors like punishment, reward, and other incentives are what drive extrinsic motivation [16]. Similar to the distinction between work context and content, there is a difference between intrinsic and extrinsic motivation [17]. Students who are intrinsically motivated in their activities are better at learning than students who are extrinsically motivated [18]. Teaching methods are effective on students' educational progress, motivating and satisfying them on developing and growing their character and creativity [19; 20]. Teacher should be skilled and also self-motivated to motivating the learners. Teacher Education plays the pivotal role in developing what skills and in order to produce qualified teacher [21]. So, it is essential to measure the learning motivation level among prospective-teachers for develop their teaching skill.

This study has been purposed to prepare and validate a standardized scale for measuring the motivational factors towards learning among prospective teachers. The present study was conducted to achieve the set purposes.

2. OBJECTIVES OF THE STUDY

The objectives of the present study stated as follows-

1. To assess the distracting items of Learning Motivation Scale using the method of item analysis.
2. To validation the scale of learning motivation by measuring its consistency.

3. METHODOLOGY

3.1 Design: Convenience sampling technique has been used for the collection of relevant data in this study [22]. This sampling technique is a kind of non-probability or non-random sampling technique [23]. In pilot studies, convenience sample is usually used because it allows the researcher to obtain basic data and trends regarding his study without the complication of using a randomized sample [24].

3.2 Participants: A population is defined as a group of individuals with at least one common characteristic which distinguishes that group from other individuals [25; 26]. To obtain a representative sample, the researcher selects each unit in a specified way under controlled condition [27; 26]. The researcher administered the scale on fifty (50) prospective-teachers of West Bengal for item analysis of the draft scale. Thereafter, the final scale has assessed the internal consistency by Cronbach's alpha and Split-half method which was applied on two hundred and twenty five (225) prospective-teachers of West Bengal.

3.3 Instrument Formation:

3.3.1 Item Generation: The researcher comprised item generation adopted using deductive (adopted from previous studies) and inductive methods (nethnographic analysis of consumer reviews) approaches [28]. The set of items was then scrutinised by experts and resource persons for its purposes, language clarity, intensity, and appropriateness. The Learning Motivation Scale questionnaire was then constructed using a group of thirty-one statements for the pre-try-out phase.

3.3.2 Sub-scales: The two subscales, Intrinsic Motivation Scale and Extrinsic Motivation Scale, are outlined in the final statements/items. Between the two subscales of the entire item-pool, the researcher had consistently attempted to maintain a balance.

3.3.3 Scoring Techniques*:* The researcher used Likert five (5) point's grade scale for the Learning Motivation Scale (LMS). The five alternative responses of Likert 5 point scale were kept for each item in the Learning Motivation Scale, "Strongly Agree," "Agree," "Neutral," "Disagree," and "Strongly Disagree" are the available options [29]. The score of each item was distributed as 'Strongly Agree'= '5', 'Agree'= '4', 'Neutral'= '3', 'Disagree'= '2' and 'Strongly Disagree'= '1'. Accordingly, for each item, the highest number is "5" and the lowest number is "1" [30; 31].

3.3.4 Pre-Try-out phase: Thirty participants, representing all the independent variables chosen in this study, from the chosen sample area of West Bengal, were given the Learning Motivation Scale in its aforementioned preliminary form. The purpose of this study was to determine any obstacles that respondents to the Learning Motivation Scale encountered when answering specific statements. The language used in the items may be complex, the statement may be confusing or unclear, or the statement may have multiple meanings and require multiple responses. The pre-tryout participants' responses served as the foundation for further analysis, screening, and editing of the statements. The opinions of the resource people and experts were sought in order to clarify any ambiguity and make the statements' language more clear. Every item was examined and improved in this manner to make it respondent-friendly. Following that, twenty-eight (28) items from the Learning Motivation Scale were retained for the final try-out phase.

3.3.5 Try-out phase: After the items have been put down and modified based on the suggestions and critiques provided by the experts, the scale is said to be ready for its experimental try-out [32]. Then, fifty (50) prospective teachers from the chosen sample area were subjected to the scale for item analysis.

3.4 Data Collection: Participants were given the questionnaire with instructions to thoroughly read it before inputting their responses in the boxes following each statement. All of the statements' scores had been accumulated according to the statements' appropriate weights.

3.5 Statistical Analysis: An item analysis method has been conducted to extract the poor items from the Scale of Learning Motivation and develop a standardize Learning Motivation Scale with good items. Item analysis examines how well each item on the test performed when it was evaluated independently, either in comparison to other items on the test or to some external criterion [33]. The common classical statistics of test item analysis are item difficulty, item discrimination, distractor analysis and reliability [34]. In the study the researcher conducted an item analysis using discrimination index to extract the poor items from the scale. Then Cronbach's alpha and Split-half method were used to determine the reliability of the test.

4. RESULT

4.1 Item Analysis

In the present study, an item analysis has been conducted using discrimination index to distract the poor items from the Learning Motivation Scale (LMS). The upper 27 percent and lower 27 percent respondents orderly ranked with highest and lowest scores respectively on the test are identified [35]. Wiersma and Jurs (1990) stated that "27% is used because it has shown that this value will maximize differences in normal distributions while providing enough cases for analysis" [36; 37]. The upper 27 percent respondents and the lower 27 percent respondents have been indicated as Higher Ability Group (HAG) and Lower Ability Group (LAG) respectively. To calculate DI in the case of a free-response item, you have

to find out the mean score (MS) i.e., average of the scores on the item in the HAG (let us represent this as MS-HAG) and the mean score on the same item in the LAG (Let us represent this as MS-LAG). The difference between the two mean scores (obtain by deducting the LAG mean score from the HAG mean score) divided by the maximum marks allotted for the item gives the DI of the item [38]. The item with a negative discrimination index (D) was deemed to be discarded; D: 0.0-0.19 was considered a poor item that should be revised; D: 0.20-0.29 was considered acceptable; D: 0.30-0.39 was considered good; and D: >0.4 was considered excellent [39]. The formula of calculating the Discrimination Index has given below-

$$\text{DI of an item} = \frac{\text{(MS-HAG) - (MS-LAG)}}{\text{Max. Score for the item}}$$

Where,

MS-HAG = Mean score of High Ability Group

MS-LAG = Mean score of Low Ability Group

Max. Score for the item = 5

Table-1: Item analysis of the items of Learning Motivation Scale based on Discrimination Index

Item No.		DI Value	Item No.		DI Value
Before	After		Before	After	
*LM1	-	0.01	*LM15	-	0.11
LM2	LM1	0.29	LM16	LM10	0.23
*LM3	-	0.11	LM17	LM11	0.23
LM4	LM2	0.23	LM18	LM12	0.26
*LM5	-	0.06	LM19	LM13	0.51
LM6	LM3	0.26	LM20	LM14	0.43
LM7	LM4	0.39	LM21	LM15	0.23
LM8	LM5	0.37	LM22	LM16	0.53
*LM9	-	0.06	LM23	LM17	0.24
*LM10	-	0.07	*LM24	-	0.11
LM11	LM6	0.23	LM25	LM18	0.53
LM12	LM7	0.31	LM26	LM19	0.57
LM13	LM8	0.43	LM27	LM20	0.26
LM14	LM9	0.27	LM28	LM21	0.29

Note: *Item rejected

Table-2: Discrimination of learning motivation items based on the general rule to interpret according to Ebel and Frisbie (1991)[40]

Discrimination Index	*Total Items*
Very Good(D>0.40)	6
Reasonably Good(0.30-0.39)	3
Marginal (0.20-0.29)	12
Poor(D<0.19)	7

According to Table 2, seven (7) items (LM1, LM3, LM5, LM9, LM10, LM15, and LM24) of the Learning Motivation Scale have poor discrimination values of 0.01, 0.11, 0.06, 0.06, 0.07, 0.11, and 0.11, respectively; these were rejected for the final scale. In the remaining items, twelve (12) items had marginal discrimination values, which can be modified for the final form of scale, and nine (9) items were reasonably good and very good items.

The items in a test should be structured in a way that makes it possible to distinguish between those with the relevant feature and those without it, and to determine this, individuals with low and high scores from the items are compared [41]. The researchers have used 't' test to find out the correlation between high ability group and low ability group. The discrimination scores are given in the below table to determine the distinctiveness of the items in the Learning Motivation Scale.

Table-3: Arithmetic Mean Standard Deviation and Discrimination values of Items for Highest 27% and Lowest 27% Groups

Items	Groups	X	σ	df	t	*p*
LM1	Highest Group	5.00	0	13	1.00	0.167
	Lowest Group	4.93	0.27			
LM2	Highest Group	4.57	0.85	13	3.44**	0.002
	Lowest Group	3.14	1.51			
LM3	Highest Group	4.79	0.43	13	1.47	0.082
	Lowest Group	4.21	1.25			
LM4	Highest Group	4.93	0.27	13	3.04**	0.004
	Lowest Group	3.79	1.42			
LM5	Highest Group	4.93	0.27	13	0.94	0.182
	Lowest Group	4.64	1.08			

LM6	Highest Group	4.79	0.43	13	2.86**	0.006
	Lowest Group	3.5	1.45			
LM7	Highest Group	4.64	0.50	13	5.68**	0.000
	Lowest Group	2.71	1.33			
LM8	Highest Group	5.00	0	13	4.45**	0.000
	Lowest Group	3.14	1.56			
LM9	Highest Group	4.79	0.43	13	1.17	0.131
	Lowest Group	4.5	0.65			
LM10	Highest Group	4.93	0.27	13	1.79	0.048
	Lowest Group	4.57	0.65			
LM11	Highest Group	4.79	0.58	13	2.51*	0.013
	Lowest Group	3.64	1.45			
LM12	Highest Group	4.57	0.51	13	3.67**	0.001
	Lowest Group	3.00	1.47			
LM13	Highest Group	4.93	0.27	13	5.49**	0.000
	Lowest Group	2.79	1.42			
LM14	Highest Group	5.00	0	13	3.39**	0.002
	Lowest Group	3.64	1.50			
LM15	Highest Group	5.00	0	13	2.51*	0.013
	Lowest Group	4.43	0.85			
LM16	Highest Group	5.00	0	13	3.47**	0.002
	Lowest Group	3.86	1.23			
LM17	Highest Group	5.00	0	13	3.17**	0.003
	Lowest Group	3.86	1.35			
LM18	Highest Group	4.64	0.50	13	2.86**	0.006
	Lowest Group	3.36	1.45			
LM19	Highest Group	4.71	0.61	13	6.39**	0.000
	Lowest Group	2.14	1.29			
LM20	Highest Group	4.86	0.36	13	4.19**	0.000
	Lowest Group	2.71	1.73			
LM21	Highest Group	4.50	0.65	13	2.45*	0.014
	Lowest Group	3.36	1.39			
LM22	Highest Group	4.86	0.36	13	6.83**	0.000
	Lowest Group	2.21	1.48			
LM23	Highest Group	4.93	0.27	13	2.65**	0.010
	Lowest Group	3.71	1.68			

LM24	Highest Group	4.93	0.27	13	1.96	0.035
	Lowest Group	4.36	1.08			
LM25	Highest Group	4.36	0.84	13	7.40**	0.000
	Lowest Group	1.71	1.07			
LM26	Highest Group	4.71	0.61	13	8.27**	0.000
	Lowest Group	1.86	1.23			
LM27	Highest Group	4.57	0.65	13	3.12**	0.004
	Lowest Group	3.28	1.49			
LM28	Highest Group	4.93	0.27	13	3.24**	0.003
	Lowest Group	3.50	1.56			

Note: ** 0.01 level of significance; * 0.05 level of significance

According to Table 3, six (6) items (LM1, LM3, LM5, LM9, LM10, and LM24) of the Learning Motivation Scale have no significant differences between the highest group and the lowest group, so these items were removed from the scale. In the remaining items, three (3) items (LM11, LM15, and LM21) have significance differences between the highest group and lowest group following the rule of '0.05 level of significance'; and nineteen (19) items of LMS have significance differences between the highest group and lowest group following the rule of '0.01 level of significance'. But the item (LM15) has a poor discrimination value according to the classical test theory, which we observed in Table 1, so this item was also removed from the scale of learning motivation. Therefore, twenty-one (21) were retained for the final form of Learning Motivation scale, which covers two subscales, namely Intrinsic Motivation Scale and Extrinsic Motivation Scale.

4.2 Validity

Validity is often defined as the extent to which a measurement tool actually measures what it is supposed to measure [42]. At the primary stage expert validation was taken as granted to ensure the face validity and content validity [43] for the scale of Learning Motivation. Semantic validation is a confirmatory step to gauge the effectiveness of the developed scale if applied to the respondents who are the focus of the research, the target sample [44]. Opinions of the resource person and experts were sought to remove ambiguity, if any, and to improve the language of the statements [45].

4.3 Reliability

As a result of the analysis made, 21 items remained on the scale, These 21 items were collected into two sub-dimensions. The researcher used both the Cronbach alpha and Split-half method to measure the internal consistency of the final scale of Learning Motivation.

The coefficient of internal consistency provides an estimate of the reliability of measurement and is based on the assumption that items measuring the same construct should correlate [42]. Alpha (α) is an estimate of the correlation between two random samples of items from a universe of items like those in the test which is found to be an appropriate index of equivalence and except for very short tests of the first factor concentration in the test [46]. In the current study, the internal consistency of the scale, which is shown in the table below, was evaluated using Cronbach's alpha.

Table-4: Results of the Cronbach Alpha Reliability of the LMS and its Sub-Dimensions (Internal-Motivation and External-Motivation)

Dimensions	n	Cronbach's Alpha
Internal-Motivation	222	0.555
External-Motivation	222	0.782
Learning Motivation Scale (LMS)	222	0.783

The first sub-dimension of motivation (internal motivation) had a Cronbach alpha value of 0.555, the second sub-dimension of motivation (external motivation) had a Cronbach alpha value of 0782, and the total scale (LMS) had a Cronbach alpha value of 0.783, according to the results.

Table- 5: Split-Half Reliability Results (Cronbach's Alpha for two halves, Correlation Between Forms, Spearman Brown Coefficient, Guttman Split-Half Coefficient) for LMS

Cronbach's Alpha	Part 1	Value	.712
		N of Items	11[a]
	Part 2	Value	.550
		N of Items	10[b]
	Total N of Items		21
Correlation Between Forms			.662
Spearman-Brown Coefficient	Equal Length		.797
	Unequal Length		.797
Guttman Split-Half Coefficient			.795
a. The items are: LM1, LM3, LM5, LM7, LM9, LM11, LM13, LM15, LM17, LM19, LM21.			
b. The items are: LM21, LM2, LM4, LM6, LM8, LM10, LM12, LM14, LM16, LM18, LM20.			

The split-half method revealed that the first and second halves of the test had Cronbach's alpha coefficients of 0.712 and 0.550, respectively. For both equal and unequal lengths, the Spearman-Brown coefficient was discovered to be 0.797. Additionally, it was discovered that the Guttman Spilit-Half Coefficient was 0.795.

In order to ensure internal consistency and reliability as a result of the analysis, the Cronbach Alpha coefficient should be at least 0.60, the correlation coefficient should be between 0.20-0.90, and the Spearman-Brown coefficient should be higher than 0.70 [47; 41].

4.4 Final Scale

The final scale of Learning Motivation consists twenty-one items in two subscales. The distributions of the items are shown in Table 6.

Table-6: Distribution of items in the final form of Learning Motivation Scale

Sl. No.	Dimension	Item no.	Total items
1	Intrinsic Motivation	2, 3, 6, 9, 11, 12, 15, 20, 21	9
2	Extrinsic Motivation	1, 4, 5, 7, 8, 10, 13, 14, 16, 17, 18, 19	12
	Total		**21**

5. DISCUSSION

After the pre-try-out phase, a Learning Motivation Scale consisting of twenty-eight (28) items administered in try-out phase to collecting data for item analysis. According to Verma, item difficulty should not be utilized as a criterion for evaluating the item's quality; instead, the item's DI value should be employed [48; 49]. Based on the Table-1 and Table-3 seven (6) items (LM1, LM3, LM5, LM9, LM10 and LM24) of LMS were rejected based on both table-2 criteria and 0.05 level of significance of 't'-test. In the remaining items, three (3) items (LM11, LM15, and LM21) have significance differences between the highest group and lowest group following the rule of '0.05 level of significance' by 't'-test, yet the item LM15 were removed from the scale having a poor discrimination value of 0.11 in the classical test theory [50]. Nineteen items (LM2, LM4, LM6, LM7, LM8, LM12, LM13, LM14, LM16, LM17, LM18, LM19, LM20, LM22, LM23, LM25, LM26, LM27 and LM28) were accepted by discrimination index both the general interpretation of classical test theory and 0.01 level of significance. The final scale retained twenty-one (21) items of learning motivation. High reliability with high positive correlation (Cronbach alpha =0.783 and Guttman Split-Half Coefficient= 0.795) validates the Learning Motivation Scale [51].

6. IMPLICATIONS

This study will assist in the development of another motivation scale for the evaluation of prospective-teachers' levels of learning motivation. The educational policymakers should frame motivational strategies to enhance teacher performance [52]. This study's creation of the Learning Motivational Scale (LMS) will assist in gathering data about the level of learning motivation of prospective teachers for further study. The level of learning motivation of prospective teachers can be measured with the support of this scale by teacher educators.

7. CONCLUSION

Effective items are first identified in the study, and then problematic items are removed using a discrimination index. Finally, Cronbach alpha and Guttman Split-Half Coefficient of reliability of the scale proved the consistency of the Learning Motivation Scale. The Scale can severe as a global indicator of one's tendency to sustain or enhance motivation in response to motivational challenge [53]. In order to overcome the challenges of motivation in education, not only external factors of motivation but also internal factors of motivation are needed among the students. Thus, the need to obtain effective scales, which permit evaluation of these factors, is highlighted [54].

Consent

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

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